Technical Data Sheet -Preliminary

Top View LEDs

45-21S/KK2C-B2832B6B9B12Z3/2T

Features

- P-LCC-3 package.
- High flux output.
- High current capability.
- White package.
- Optical indicator.
- Colorless clear window.
- Ideal for backlight and light pipe application.
- Inter reflector.
- Wide viewing angle.
- Suitable for automatic placement equipment.
- Suitable for vapor-phase reflow.
- Available on tape and reel (8mm Tape).
- Pb-free.
- The product itself will remain within RoHS compliant version.

Descriptions

- The 45-21S series is available in soft orange, red and yellow. Due to the package design, the LED has wide viewing angle and optimized light coupling by inter reflector.
- This feature makes the ideal for light pipe application. The low current requirement makes this device ideal for portable equipment or any other application where power is at a premium.

Applications

- Indicator and backlight for audio and video equipment.
- Indicator and backlight in office and family equipment.
- Flat backlight for LCD's, switches and symbols.
- Light pipe application.
- General use.

Device Selection Guide

Chip Material	Emitted Color	Resin Color
InGaN	Warm White	Water Clear

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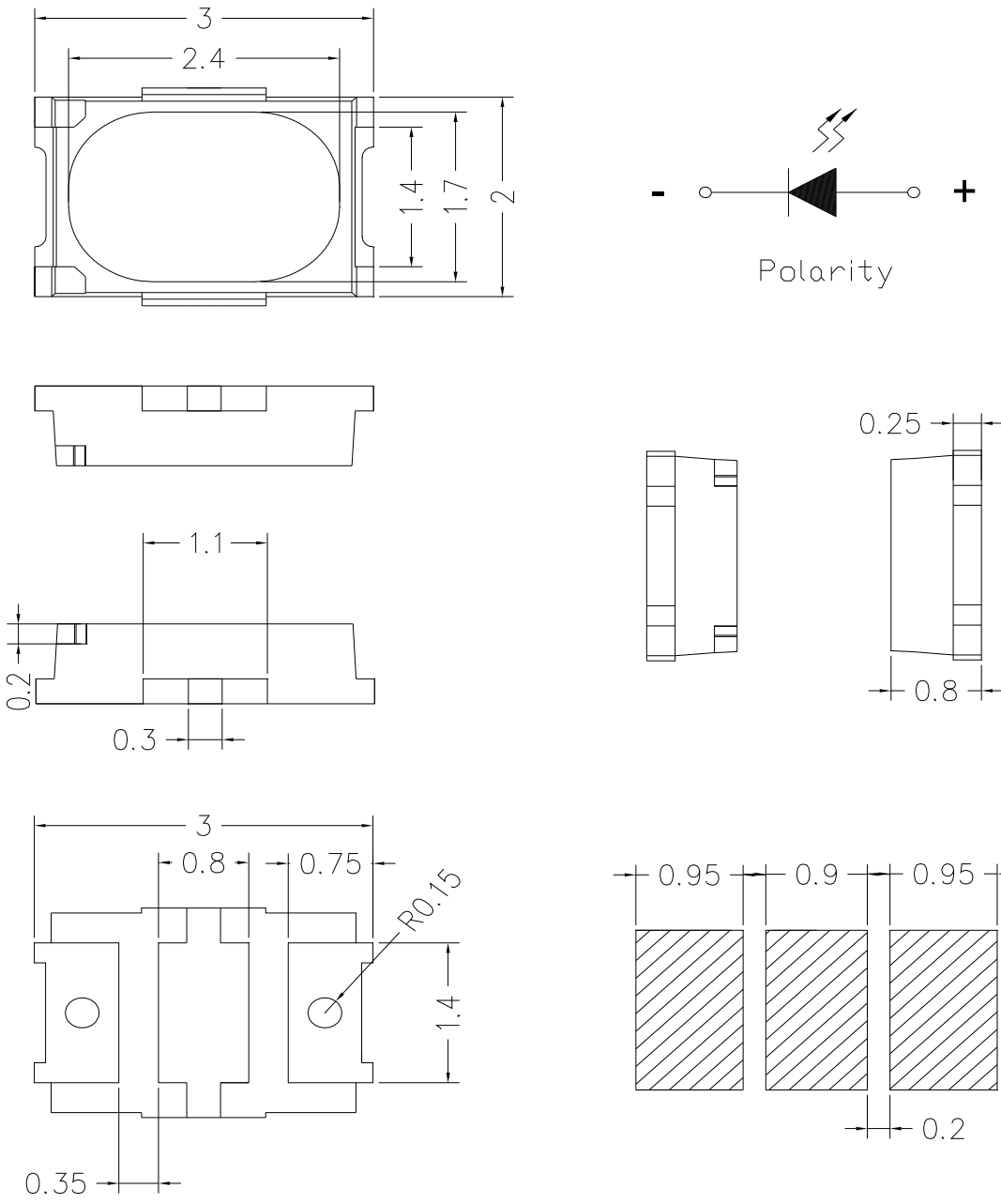
Package Dimensions



Note: The tolerances unless mentioned is ±0.1mm ;Unit = mm

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Absolute Maximum Ratings (T_A=25℃)

Parameter	Symbol	Rating	Unit
Reverse Voltage	V_R	5	V
Forward Current	I_F	30	mA
Peak Forward Current (Duty 1/10 @1KHz)	I_{FP}	100	mA
Power Dissipation	Pd	110	mW
Electrostatic Discharge(HBM)	ESD	1000	V
Operating Temperature	T_{opr}	-40 ~ +85	℃
Storage Temperature	T_{stg}	-40 ~ +90	℃
Soldering Temperature	Tsol	Reflow Soldering : 260 ℃ for 10 sec. Hand Soldering : 350 ℃ for 3 sec.	

Electronic Optical Characteristics (T_A=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	Φ	8	-----	10	lm	I_F=30mA
Viewing Angle	$2\theta_{1/2}$	-----	120	-----	deg	I_F=30mA
Forward Voltage	V_F	2.7	-----	3.4	V	I_F=30mA
Color Rendering Index	----	80	----	----	----	I_F=30mA
Reverse Current	I_R	-----	-----	50	uA	V_R=5V

Note:

1. Tolerance of Luminous Flux: ±11%
2. Tolerance of Forward Voltage: ±0.05V
3. Tolerance of Color Rendering Index : ± 2

Technical Data Sheet -Preliminary

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Bin Range of Luminous Flux

Bin	Min.	Max.	Unit	Condition
B6	8.0	8.5	lm	I_F=30mA
B7	8.5	9.0		
B8	9.0	9.5		
B9	9.5	10.0		

Bin Range of Forward Voltage

Groups	Bin	Min.	Max.	Unit	Condition
B12	34	2.7	2.8	V	I_F=30mA
	35	2.8	2.9		
	36	2.9	3.0		
	37	3.0	3.1		
	38	3.1	3.2		
	39	3.2	3.3		
	40	3.3	3.4		

Notes:

1. Tolerance of Luminous Flux: ±11%
2. Tolerance of Forward Voltage : ±0.05V

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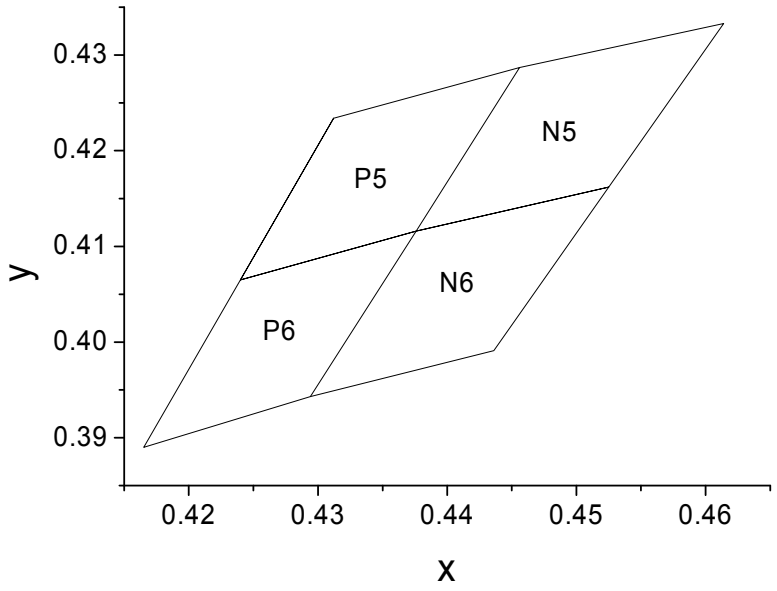
Bin Range of Chromaticity Coordinate I_F=30mA

CCT	Bin Code	CIE_x	CIE_y	CCT	Bin Code	CIE_x	CIE_y
3250K ~3050K	P5	0.4312	0.4234	3050K ~2850K	N5	0.4456	0.4287
		0.4456	0.4287			0.4614	0.4333
		0.4376	0.4116			0.4525	0.4162
		0.4240	0.4065			0.4376	0.4116
	P6	0.4240	0.4065		N6	0.4376	0.4116
		0.4376	0.4116			0.4525	0.4162
		0.4294	0.3943			0.4436	0.3991
		0.4165	0.3890			0.4294	0.3943

Notes: Tolerance of Chromaticity Coordinates：±0.01

The CIE 1931 Chromaticity Diagram



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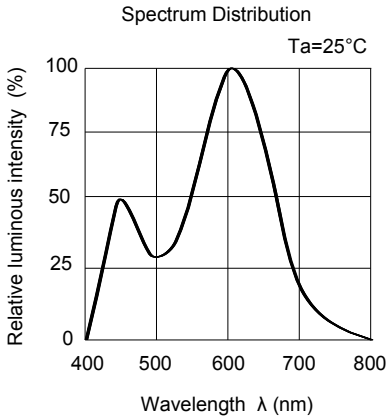
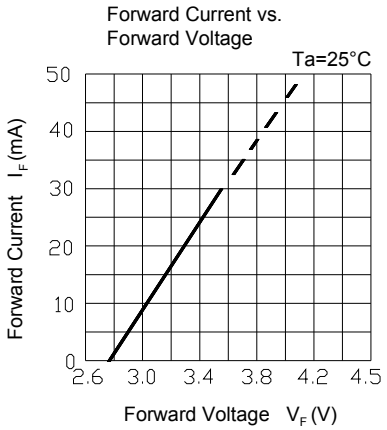
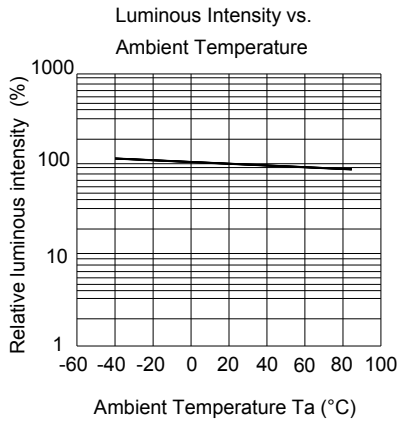
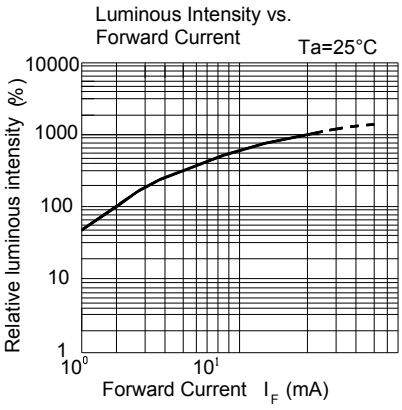
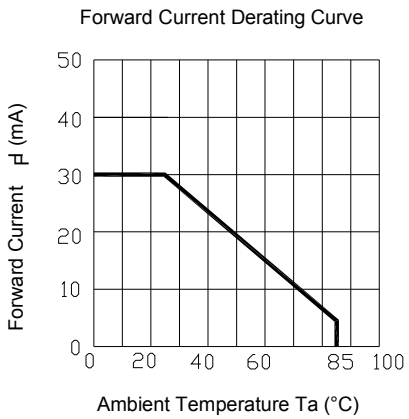
Typical Electro-Optical Characteristics Curves

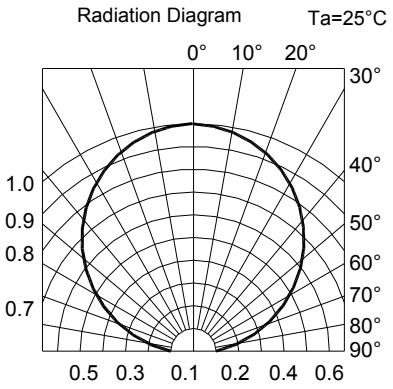












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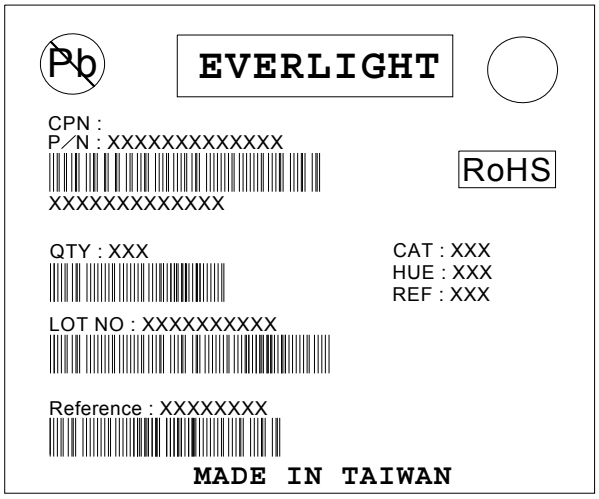
Label Explanation

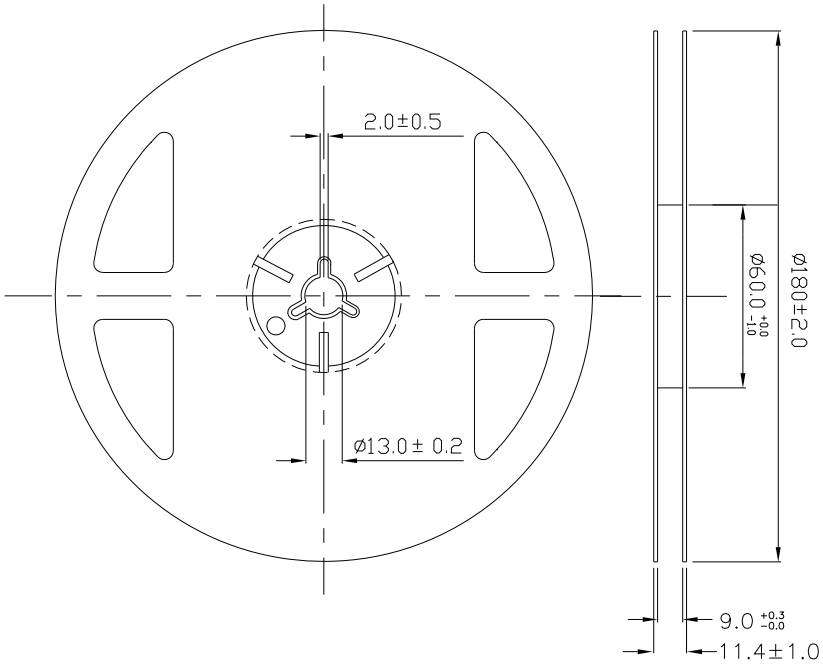
CAT: Luminous Intensity Rank

HUE: Chromaticity Coordinates

REF: Forward Voltage Rank



Reel Dimensions



Note: The tolerances unless mentioned is : ±0.1mm,Unit = mm

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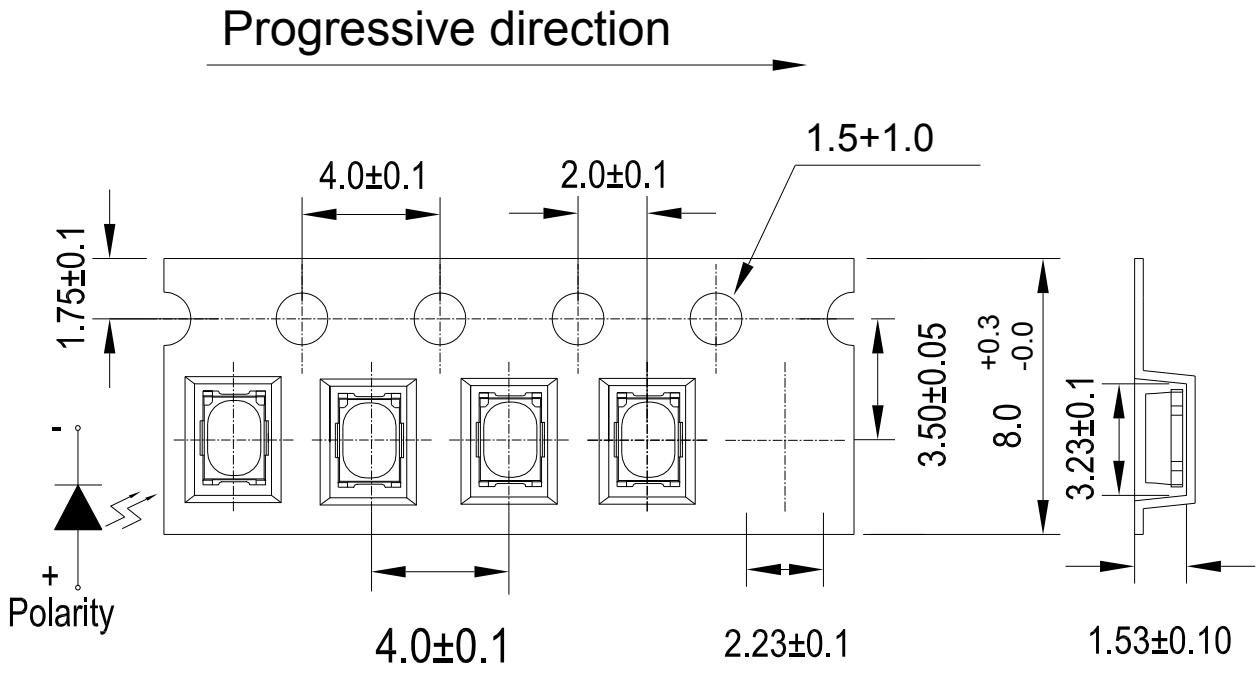
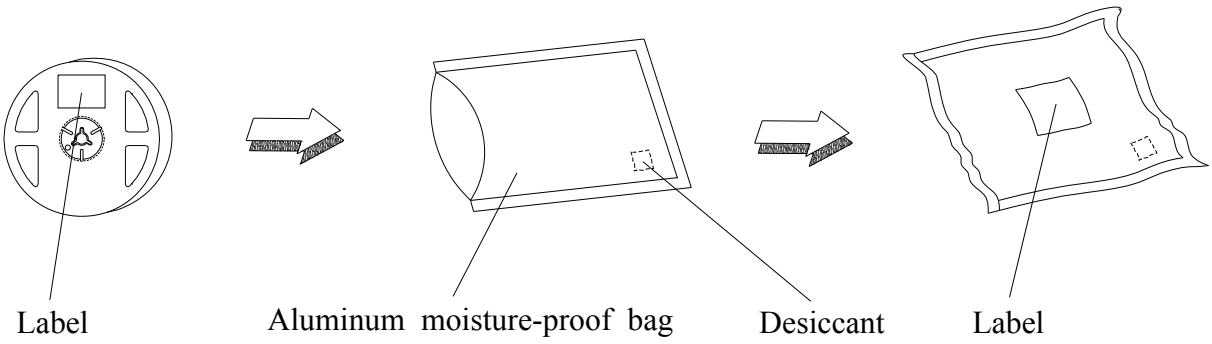
Carrier Tape Dimensions; Loaded Quantity 2000 pcs Per Reel



Note: 1.The tolerances unless mentioned is : ±0.1mm,Unit = mm
2.Minimum packing amount is 250/500/1000/2000 pcs per reel

Moisture Resistant Packaging



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Reliability Test Items And Conditions

The reliability of products shall be satisfied with items listed below.
Confidence level：90%
LTPD：10%

No.	Items	Test Condition	Test Hours/Cycles	Sample Size	Ac/Re
1	Reflow Soldering	Temp. : 260℃±5℃ Max. 10 sec.	6 Min.	22 PCS	0/1
2	Temperature Cycle	H : +100℃ 15min ∫ 5 min L : -40℃ 15min	300 Cycles	22 PCS.	0/1
3	Thermal Shock	H : +100℃ 5min ∫ 10 sec L : -10℃ 5min	300 Cycles	22 PCS.	0/1
4	High Temperature Storage	Temp. : 100℃	1000 Hrs.	22 PCS.	0/1
5	Low Temperature Storage	Temp. : -40℃	1000 Hrs.	22 PCS.	0/1
6	DC Operating Life	I_F = 20 mA / 25℃	1000 Hrs.	22 PCS.	0/1
7	High Temperature / High Humidity	85℃/85%RH	1000 Hrs.	22 PCS.	0/1

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Precautions For Use

1. Over-current-proof

   Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change (Burn out will happen).

2. Storage

   2.1 Do not open moisture proof bag before the products are ready to use.

   2.2 Before opening the package: The LEDs should be kept at 30℃ or less and 90%RH or less.

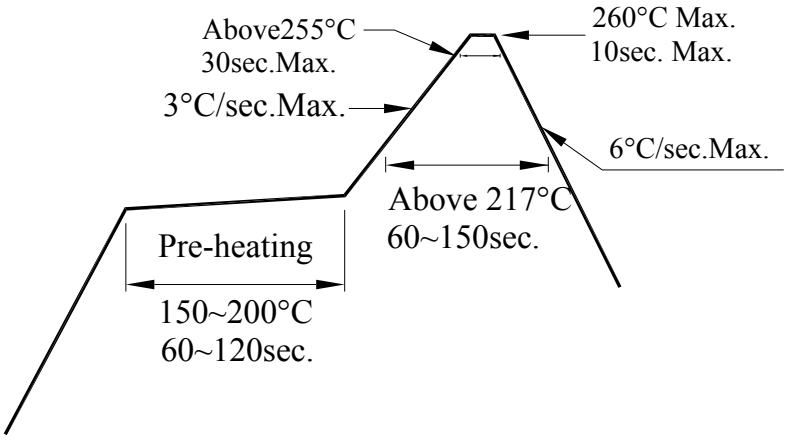
   2.3 After opening the package: The LED's floor life is 168hrs under 30℃ or less and 60% RH or less.If unused LEDs remain, it should be stored in moisture proof packages.

   2.4 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.

   Baking treatment : 60±5℃ for 24 hours.

3. Soldering Condition

   3.1 Pb-free solder temperature profile



   3.2 Reflow soldering should not be done more than two times.

   3.3 When soldering, do not put stress on the LEDs during heating.

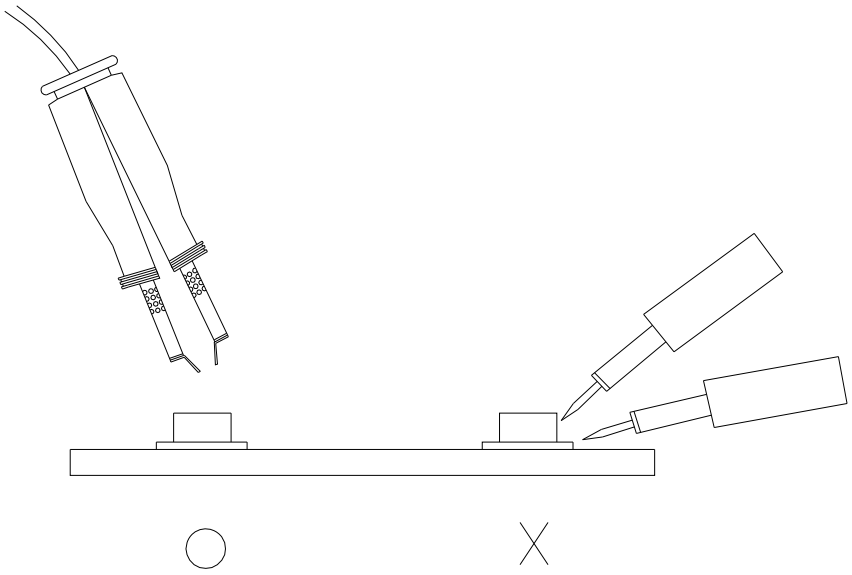
   3.4 After soldering, do not warp the circuit board.

4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350℃ for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

5. Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.



EVERLIGHT ELECTRONICS CO., LTD.
Office: No 25, Lane 76, Sec 3, Chung Yang Rd,
Tucheng, Taipei 236, Taiwan, R.O.C
Tel: 886-2-2267-2000, 2267-9936
Fax: 886-2267-6244, 2267-6189, 2267-6306
http://www.everlight.com